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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/930,065	08/15/2001	Narayanan Ganapathy	40062.110US01	9562

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EXAMINER	
CAO, DIEM K	

ART UNIT	PAPER NUMBER
2126	

DATE MAILED: 10/18/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/930,065	GANAPATHY, NARAYANAN	
	Examiner	Art Unit	
	Diem K Cao	2126	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *15 August 2001*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-19* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-19* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☒ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date *9/24/2001*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

1. Claims 1-19 are presented for examination.

Specification

2. The disclosure is objected to because of the following informalities: on page 12, lines 2-4, the specification discloses "In order to have various ... to the kernel interface module", it is unclear whether the application program performs a system call or could be different module.

Appropriate correction is required.

Claim Objections

3. Claim 12 is objected to because of the following informalities: because claim 12 is independent claim, claim 12 should be rewritten to list all of the steps recited in claims 1 and 9.

Appropriate correction is required.

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

5. Claims 1-10 and 12-19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Admitted Prior Art (APA) in view of Talluri et al. (U.S. 5,961,606).

6. **As to claim 1**, APA teaches a client application program (an executing application; page 2, lines 1-2), a host channel adapter (a host channel adapter; page 2, line 1), registering a buffer of memory related to the host channel adapter (the application must register a buffer of memory ... into the HCA; page 2, lines 4-6), allowing the application program access to the registered buffer to perform a request (the application issues an I/O request on the buffer; page 2, lines 9-10). APA further discloses the buffer is de-registered after the request is performed (the request is performed and then the buffer is de-registered; page 2, line 10).

7. However, APA does not teach maintaining the buffer as registered to allow the application program to perform another request using the registered buffer. Talluri teaches maintaining the memory segments and buffers allocated in the memory segments as registered to allow the application program to perform another request using the registered buffer (The sending node ... a specified size; col. 12, lines 40-45, the sending node initializes ... for the new segment; col. 12, lines 60-61, the procedure allocates one or more receive buffers ... of buffers allocated; col. 14, lines 43-47, the sending node ... reuse of the segment; col. 16, lines 8-11, and Once the Status is set to active, the segment become available for use by message sending procedures in the sending node; col. 16, lines 33-35).

8. It would have been obvious to one of ordinary skill in the art at the time the invention was made to combine the teaching of APA and Talluri because it will increase the performance of the system by avoiding the need to tear down and rebuild the MMU and virtual memory

mapping for old and new segments (col. 13, lines 46-49), and eliminate the message traffic normally required to allocate individual receive buffers (col. 15, lines 60-63).

9. **As to claim 2**, APA teaches the distribute network is a system area network (System Area Network; page 1, lines 11-14).

10. **As to claim 3**, Talluri teaches the act of maintaining the buffer as registered comprises maintaining a list of registered buffers (#BufsCreated 404; col. 9, lines 43-45, and the procedure allocated ... of buffers allocated; col. 14, lines 43-47).

11. **As to claim 4**, Talluri teaches the list is a lookup table (Imported Segment Table; col. 9, lines 24-45 and the sending node uses the #BufsCreated ... by the receiving system; col. 15, lines 44-47).

12. **As to claim 5**, Talluri teaches receiving a request to free the buffer (the receiving node ... receipt of a Segment Release request message; col. 14, lines 1-4), and de-registering the buffer so that the application program cannot use the buffer to perform a request (The procedure begins ... for the segment; col. 14, lines 4-19).

13. **As to claim 6**, Talluri teaches the request to free the buffer is a request to change the properties of the buffer (Status 412; col. 10, lines 1-13).

14. **As to claim 7**, Talluri teaches the act of de-registering the buffer is performed by the operating system (a message receive procedure 348; col. 8, lines 25-29, procedures 358,360; col. 8, lines 44-46 and the receiving node procedure ... for the segment; col. 14, lines 1-19).

15. **As to claim 8**, Talluri teaches the act of de-registering the buffer is not performed by the application program (The Request Segment Release procedure; col. 13, lines 50-60 and col. 8, lines 18-21, 44-46, 62-63 and the receiving node procedure ... for the segment; col. 14, lines 1-19).

16. **As to claim 9**, Talluri teaches evaluating whether the buffer (inherent from segment) should be de-registered, and if the buffer should be de-registered, de-registered the buffer (col. 14, lines 1-19).

17. **As to claim 10**, APA does not teach the act of evaluating whether the buffer should be de-registered is performed by the operating system using garbage collection techniques. It is well known in the art that garbage collection techniques are used to reclaim the memory that is not been used, and there is a method to mark which memory will be garbage collected. It would have been obvious to one of ordinary skill in the art to combine the teaching of APA and well-known techniques because it would improve the system development by reusing the available methods.

18. **As to claim 12**, see rejections of claims 1 and 9 above.

19. **As to claim 13**, APA teaches an application can register a buffer of memory (Prior to directly ... buffer of memory; page 2, lines 4-5), and the buffer is de-registered after the request is performed (page 2, line 9).

20. However, APA does not explicitly teach a buffer registration module and a buffer de-registration module. Talluri teaches a registration module that register segment memory and buffers associated with the segments (a segment importing procedure; col. 8, lines 50-51 and a segment exporting procedure; col. 8, lines30-31), and de-registration module that de-register segment memory and buffers associated with the segments (procedure 358; col. 8, lines 44-46 and procedure 374; col. 8, lines 62-63).

21. It would have been obvious to one of ordinary skill in the art at the time the invention was made to combine the teaching of APA and Talluri because it will increase the performance of the system by avoiding the need to tear down and rebuild the MMU and virtual memory mapping for old and new segments (col. 13, lines 46-49), and eliminate the message traffic normally required to allocate individual receive buffers (col. 15, lines 60-63).

22. **As to claim 14**, Talluri teaches a request to de-register a buffer is explicitly made by an application program (the sending node can execute ... release of the segment; col. 13, lines 38-41).

23. **As to claim 15**, Talluri teaches the request to de-register a buffer is to free the buffer (execute the Request Segment Release procedure to initiate the de-allocation and release of the segment; col. 13, lines 38-41).

24. **As to claim 16**, see rejection 6 above.

25. **As to claim 17**, see rejections of claims 13-14 above. Talluri further teaches a kernel interface module for receiving a request, the request having information related to a virtual address value and a length value (a message receive procedure 348; col. 8, lines 25-29, col. 9, lines 2-11, and col. 12, lines 40-45), a maintenance module for maintaining a record of registered buffers (procedures 360 and 376; col. 8, lines 44-46 and 62-63 and Import Segment Table and Export Segment Table; col. 9, line 12 – col. 10, line 24).

26. **As to claim 18**, Talluri teaches the kernel interface is part of an operating system (a message receive procedure ... operating system's kernel; col. 8, lines 25-29).

27. **As to claim 19**, Talluri teaches the registration module, maintenance module and de-registration module are part of the operating system (obvious from the fact that those modules are not part of applications).

28. Claim 11 is rejected under 35 U.S.C. 103(a) as being unpatentable over Admitted Prior Art (APA) in view of Talluri et al. (U.S. 5,961,606) further in view of Provino et al. (U.S. 6,535,929 B1).

29. **As to claim 11**, see rejections of claims 1 and 5 above. However, APA and Talluri do not teach determining whether the buffer is registered. Talluri teaches the system includes a Imported Segment Table for keeping track of the segments and buffers allocated within those segments (col. 8, lines 55-56 and col. 9, lines 43-45). Provino teaches a lookup function is used by the register and de-register methods (col. 6, lines 62-67, and col. 7, lines 29-34). It would have been obvious to one of ordinary skill in the art at the time the invention was made to combine the teaching of APA, Talluri and Provino so the applications don't have request for the new buffer/segment when they already have access to them.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Diem K Cao whose telephone number is (703) 305-5220 or (571) 272-3760 (effective November 1st 2004). The examiner can normally be reached on Monday - Thursday, 9:00AM - 5:00PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Meng-Ai An can be reached on (703) 305-9678 or (571) 272-3760 (effective November 1st 2004). The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Any response to this action should be mailed to:
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